Rethinking Luminaire Manufacturing for SSL

What do we test now?

Mark Hand

Director, New Products & Technology

DOE Manufacturing R&D Workshop

San Jose CA June 13th 2012

AcuityBrands.

Electrical Luminaire Testing

"The good old days"

AcuityBrands.

What did we test before?

Before the advent of SSL. In the days of HID and Fluorescent. In the Electrical age

LAB

- Photometrics ………………..but it was all relative

- UL1598

- IP

- ANSI

PLANT

- Hi-Pot

- 100% Light Up

What didn't we test before?
Before the advent of SSL. In the days of HID and Fluorescent. In the Electrical age

- Lamp CRI

- Lamp CCT

- R9

- Every Photometric Option

SSL

2 Modules
X 6 Optics
X 4 CCTs
X 3 Drive Currents
= 144 Photometric Tests

HID

1 Luminaire
X 3 Optics
X 3 Reflectors
X 13 Lamps
X 9 Ballast types
= ~~1053~~ Photometric Tests
25

SSL Luminaire Testing
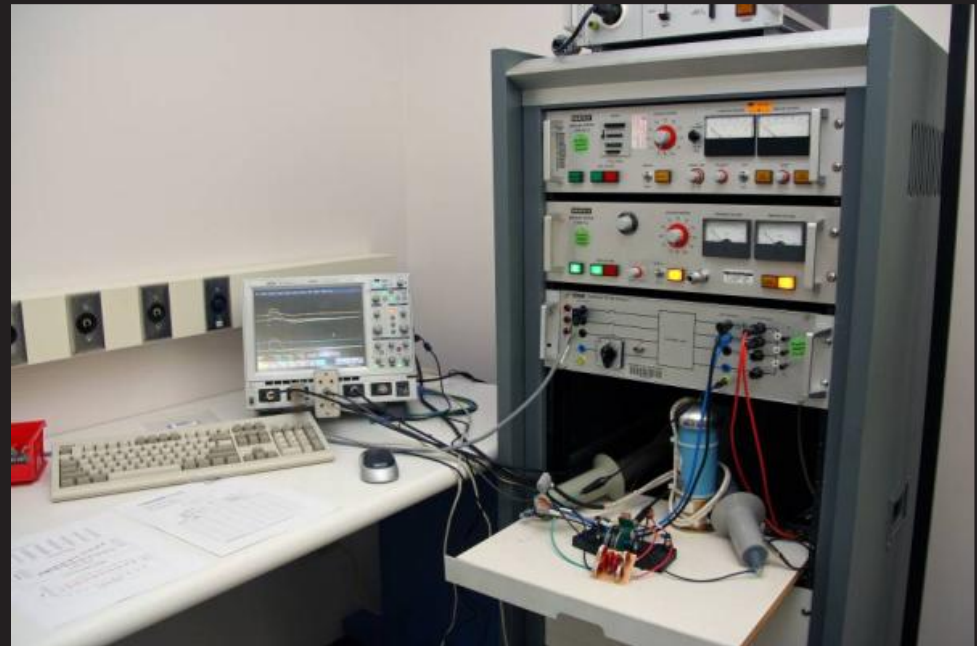
"Our digital lighting experience"

What do we test now?

After the advent of SSL. In the digital age

- Photometrics ……………….but it's all absolute

- UL8750

- IP

- ANSI

+ Design Validation testing

PLANT

- Hi-Pot

- Light Up

+ Assembly Validation Testing

+ Installed Validation Testing

*Acuity*Brands.

Validation Testing

Above and beyond UL8750

Design Validation Testing

- Photometrics ………………hope that's not a surprise

- FCC Compliance

- Harmonic and Transportation Vibrations

- Power Anomalies

- ESD

- Surge

- Thermal Anomalies

- Humidity Testing

Assembly Validation Testing (SMD)

- Standard tests for an Electronic PCB Manufacturing line

- AOI
  - > Light Up
  - > Intensity (are all the chips on?)

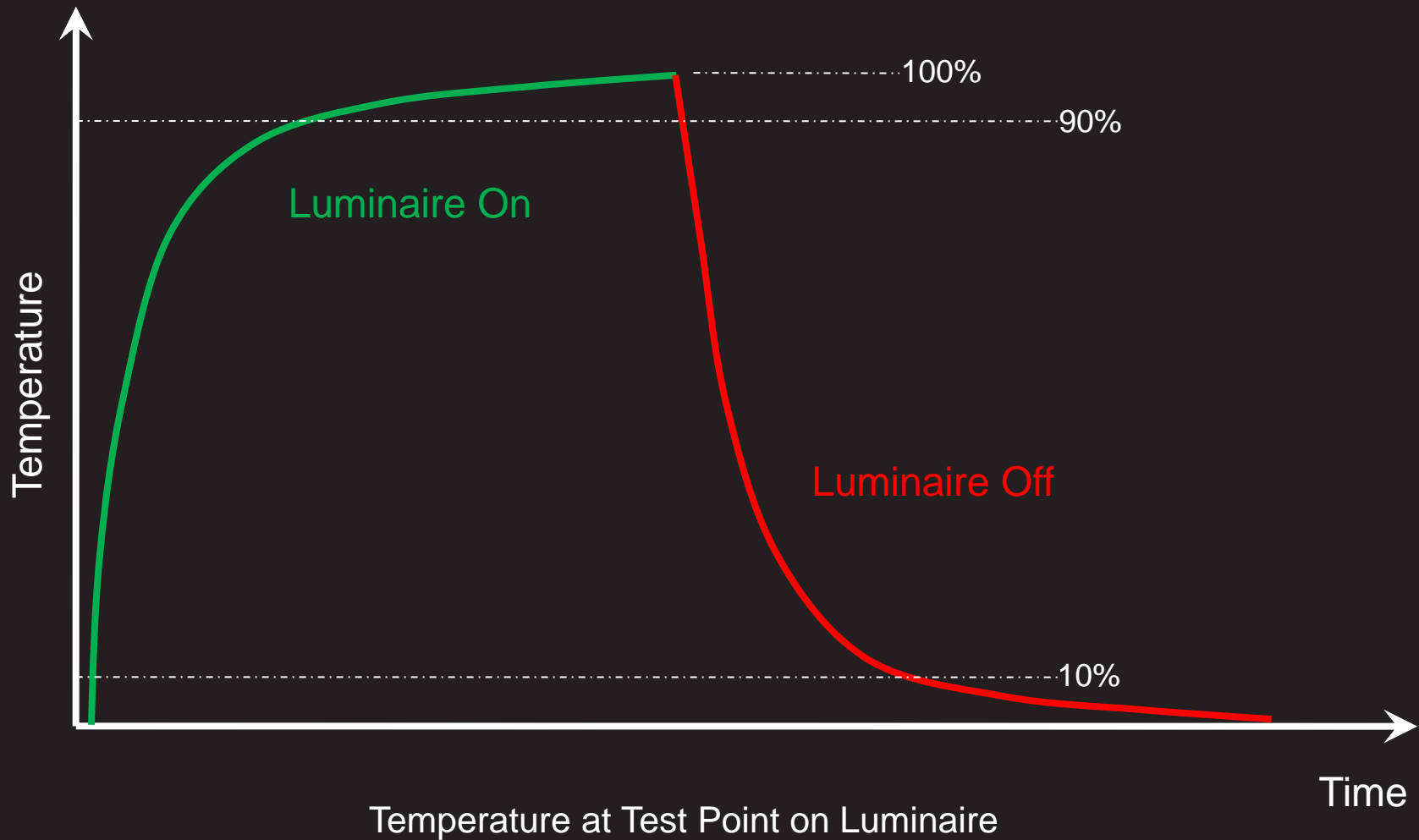- Color Check……….how many steps?

*Acuity*Brands.

Assembly Validation Testing

- 100% Turn On

- Hi-Pot Testing

- Photometric assessment
  - > Color
  - > Lumen Level

- Early Lifetime Failure Detection
  - AKA Infant Mortality Detection
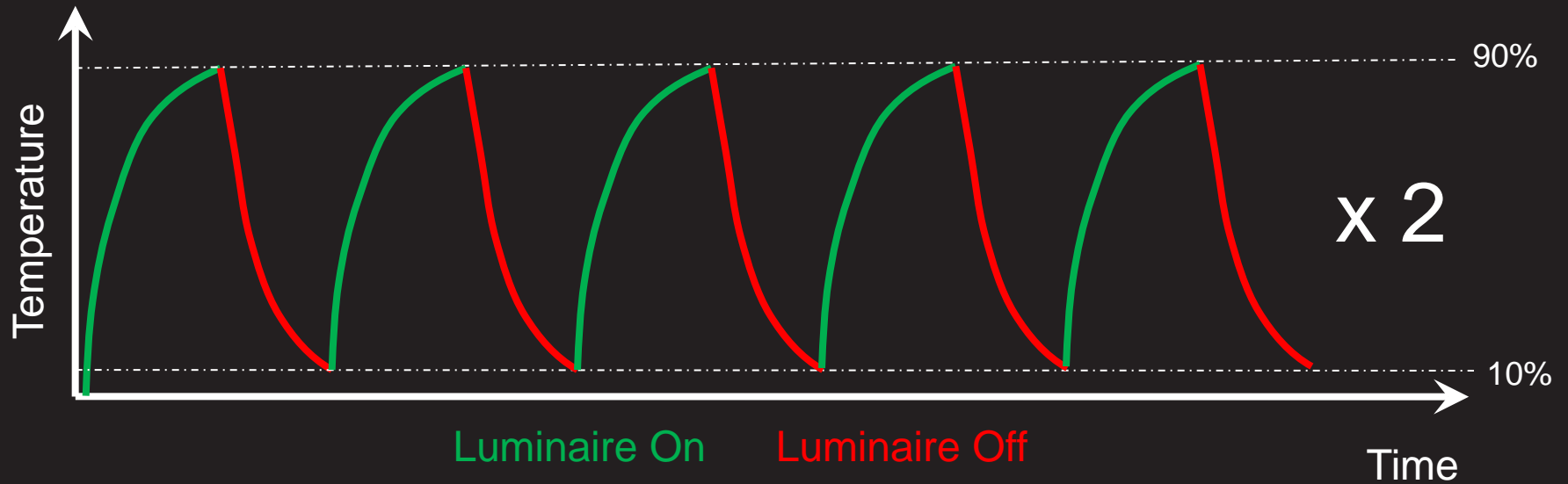 - AKA Burn-In Testing
  - AKA Soak Testing
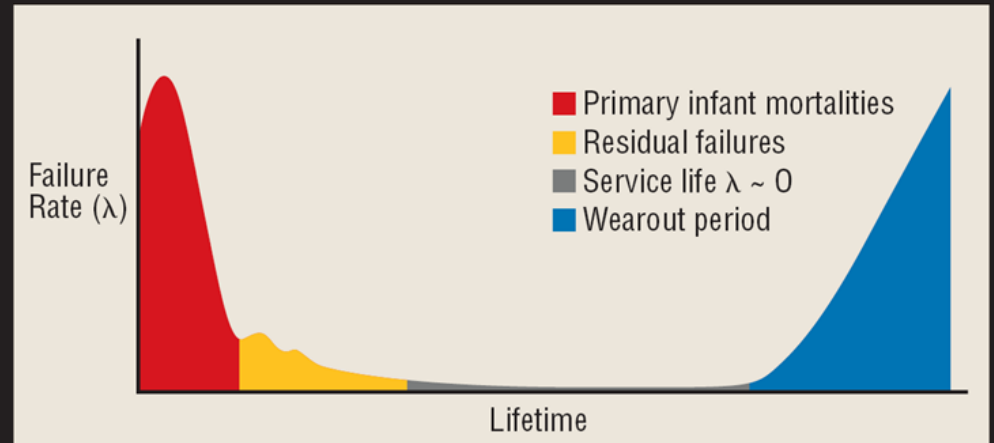
Assembly Validation Testing

- Early Lifetime Failure Detection

Temperature at Test Point on Luminaire

Assembly Validation Testing

- Early Lifetime Failure Detection

x 2

Luminaire On   Luminaire Off

Installed Validation Testing

- Extreme
- Standard

Summary

Summary

- The industry has changed.

- Regulatory testing alone isn't sufficient anymore

- Validation Testing is needed to ensure Quality and Reliability

- Manufacturing capabilities, equipment, processes and staff must change

- When will it be enough?

*Acuity*Brands.

Thank You

AcuityBrands.